

PHYSICS 221: ELEMENTS OF PHYSICS

University of Tennessee, Fall 2021

Instructor:	Prof. Holmes	Time:	Tuesday 8:10 – 9:25
Email:	tholmes@utk.edu	Place:	Nielsen 415

Course Page: <https://utk.instructure.com/courses/134341>

Teaching Assistants: TBA

Textbook:

- OpenStax College Physics, <https://openstax.org/details/books/college-physics> (Free)
- Supplemental practice problems: OpenStax Tutor, College Physics (\$10)

Overview: Welcome to Physics! This course covers basic physical principles and applications, and fulfills the first half of the physics requirement for pre-medical, pre-pharmacy and pre-veterinary programs. Topics include mechanics, heat, and wave motion.

Prerequisites: MATH 130 or MATH 131 or MATH 132 or MATH 125 or MATH 141 or MATH 151 or MATH 152. Any calculus course is also an appropriate prerequisite.

Structure:

Physics 221 is a 4 credit-hour introductory physics course with a laboratory component. Students meet all together once a week (Tuesdays, 8:10 - 9:25) and once a week, by section, in a studio physics classroom (Wed/Thu/Fri, room 203 Nielsen Physics Building).

This course is designed to give students an opportunity to direct their own learning. Each week, you will be expected to read the course material before the Tuesday class. The full class meetings on Tuesday are not formal lectures, but a discussion of concepts that students are expected to learn outside of class. You will practice concepts by solving problems, and responses will be recorded as part of the participation component of the course. After each full class meeting, you will complete an online pre-lab assignment.

The studio sessions are a combination of a laboratory and discussion section. You will perform experiments, and session instructors will guide you to further explore the physics concepts introduced in the reading assignments and gain an understanding of how these concepts apply to a wide range of real world problems and situations. After each studio session, you'll submit a laboratory report.

You'll be graded on a combination of homework, pre-lab assignments, lab reports, participation, and midterm and final scores. In order to pass, you must have at least 60% on your lab reports.

Tentative Course Outline:

Aug. 24		Position, Velocity, and Acceleration	Ch. 2
Aug. 31		Newton's Laws of Motion	Ch. 4
Sep. 7		Applications of Newton's Laws of Motion	Ch. 3,5
Sep. 14		Work and Energy	Ch. 7
Sep. 21		Momentum	Ch. 8
Sep. 28		Week off!	
Oct. 5		Rotational Motion	Ch. 9,10
Oct. 12		Review	
Oct. 19		Static Fluids	Ch. 11
Oct. 26		Fluid Dynamics	Ch. 12
Nov. 2		Temperature and Heat	Ch. 13,14
Nov. 9		Thermodynamics	Ch. 15
Nov. 16		Mechanical Waves	Ch. 16
Nov. 23		Sound	Ch. 17
Nov. 30		Review	

Grading Policy: Homework and pre-lab assignments (25%), lab reports (20%), tests (35%), class participation (20%). Class participation beyond what is required will earn you extra credit. You have three attempts at each assignment, and the best score will be taken.

Tentative Exam Dates:

Midterm	Oct. 13-15, 2021
Final Exam	TBA

Course Policies:

- **Code of Conduct:** This class welcomes people with many different experiences and backgrounds, all of whom should feel comfortable participating in group work and discussion. Questions should be asked and answered respectfully. No forms of harassment, including any form of abuse or exclusionary jokes, will be tolerated in the classroom or in any online forums.
- **Pronouns and Preferred Names:** I'm happy to address you by a preferred name and gender pronoun – just send me an email or come talk to me if you'd like to let me know what they are.
- **Academic Integrity:** Please do not cheat. If you find yourself struggling with material, please reach out to me or your TA, and we'll be more than happy to help. It's why we're here.
- **Missed homework, exams, etc:** Contact the [Office of the Dean of Students](#) if you have extenuating circumstances, and fill out an absence notification. Otherwise, no late work is accepted.
- **Grading scale:** This course is graded with the standard grading scale in which scores in the 90s result in an A, scores in the 80s result in a B, etc.

If you need course adaptations or accommodations because of a documented disability, please contact [Student Disability Services](#) (SDS). This will ensure that you are properly registered for the services provided by SDS.

Participation:

Participation is a key component of this course, but participation can mean different things to each student. Fundamentally this is an opportunity for you to have your level of engagement boost your overall grade in the course. Participation is required, but participation above the required amount will result in extra credit: if you max out your participation score, your overall score will be boosted by a **full lettergrade**.

Here's how it works: every week you need 15 participation points to get full credit, but you can earn up to 22.5 (i.e. it's possible to get up to 150% credit each week). You can pick how you earn your points from a menu of different options, depending on how you personally like to engage with with courses:

- In-class participation (15 points): You'll earn up to 10 points each week for participating in in-class poll questions, and 5 points each week for getting the correct answers.
- Discussion forum (10 points): You'll earn points for starting conversations on the discussion forum about the material, and for answering your peers' questions. Points are awarded for content, not for number of posts.
- Office Hours (10 points): If you attend my office hours of those of any of the course TAs, you'll get participation points. You get 5 points for attending, and another 5 if you participate in discussion.
- Open Stax Tutor (10 points): While your textbook is free, there's a partner service that costs \$10 for the semester which will guide you through supplemental reading and ask comprehension questions. You'll get 5 points for answering questions, and another 5 points for correctness of those answers.

All together that's 45 points available each week, but your credit will max out when you've received half of them. Try out different participation modes and see what works for you!